

DIY

Worthwhile projects you can build on your own



Installing your own Pockrus J-pole antenna

Taking the advice of so many of your ham friends, you sunk \$30 and purchased an open-stub J-pole of your very own from Carl Pockrus, and now you're ready to announce your call sign to the entire valley. That's good, because you'll soon find out how much better that gem can perform, over the stock *rubber duck* that came with your handheld radio. But where do you set it up when you want to transmit?

Assuming you're going to mount your J-pole outside, the three ways people typically mount them are on the gabled eaves, on a sewer vent pipe, or on a mast attached to or near (like you would a flagpole) your house. A few have mounted them in their attics with some success. This article discusses the gabled eave-mount approach, because it's the worst case (most involved and complicated) of all of them, but the one I recommend most for a permanent installation, to provide optimum performance and stability.

Parts list (total = \$360.00, give or take):

Pockrus Joystick™ J-pole antenna \$30

Channel Master™ CM-9030 eave mount \$35

1/2" rubber cable clamps \$1.70 per pair (6 pairs = \$10.20)

#10 X 3/4" stainless pan-head sheet metal screws \$3 for 25

4 AWG solid copper ground wire \$1.50 per foot (30 feet = \$45.00)

Heat shrink tubing \$2 for LMR-400 (or \$2 for LMR-240 / RG-8X)

Times Microwave™ LMR-400 coaxial cable with PL-259 connectors \$105 for 75 feet

10-foot X 1-3/8" top-rail mast \$13

Nashua™ Stretch & Seal self-fusing silicone tape \$7

PL-259 crimp connector for LMR-400 \$2.80

Alpha Delta™ TT3G50U-HP lightning arrester \$60

Three 1/2" grounding clamps \$9

U-bolt for 1" pipe (1-3/8" ID) \$3

11" zip ties \$11 for 100

8-foot X 1/2" grounding rod \$12

1-1/2" zinc-plated corner brace \$3

Tools list:

tape measure

LMR-400 crimpers

extension cord

soldering iron, solder

wrench set, crescent wrench

sharp knife (box cutter, X-Acto, etc.)

hack saw

Ohmmeter

big wire cutters, small wire cutters

ladder

drill motor, drill bits, screwdriver bits, nut driver

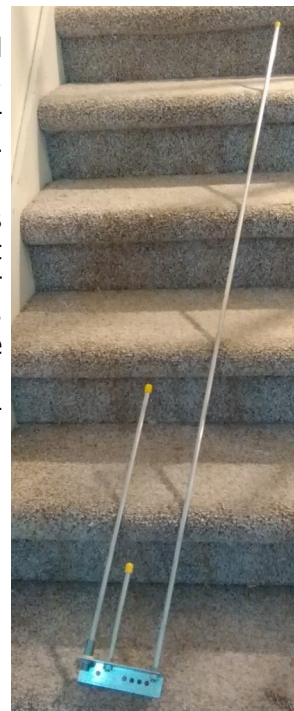
heat gun

scissors

wire stripper

level

nut driver



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Eave-mounting the mast

Assemble the eave mount, adjusting its length so that, when mounted on the middle face of your eaves, the center is between 1-1/2 to 2 feet below the crown of your roof. Securely attach the upper support bracket of the eave mount (drill 7/32" holes) to the center of the eaves, right in front of the crown of your roof. Be sure to mark and then drill out the holes before you drive the bracket bolts into the eaves. Depending on your roof angle (most roofs are built with a 4/12 or 5/12 pitch), cut about three or four feet off the tapered end of the top-rail mast. Loosely clamp the mast to the upper support bracket, so that you can somewhat easily slide it up and down, without it completely falling off.

Mark the location of the mounting holes so that the eave mount sits level when the holes are located near the middle face of the eaves. At the same time, lightly clamp the top-rail mast to the eave mount, so that you can stand the mast vertically level on the mount. This gets tricky, because you need to level the mount, keep the mast square with the mount, and locate the mount on the eaves, all at the same time. Drill and then bolt the mount to the eaves where you marked the holes.



Measure and drill a 5/16" hole in the angle bracket of the J-pole to fit the 1" U-bolt, then loosely install the U-bolt to it. Lower the loose U-bolt of the J-pole over the mast, and securely attach the J-pole to the mast, with the U-bolt, making sure that no more than 1/4" of mast appears above the angle bracket, if you mount the mast outside the angle bracket, as in the photo on the next page. (You can optionally mount the mast inside and under the angle bracket.) Tighten the top and bottom bracket bolts that hold the mast in place. Attach one of the grounding clamps to the mast just above or below the upper support bracket (not shown.)

Thread the coax so that one end emerges between the eave face and the eave mount. Create an [RF choke](#) by coiling the end of the coax out of six loops that are about six inches in diameter, leaving about four inches for the connector to attach to the J-pole. Use zip ties to maintain the coil shape of the choke. Securely connect the PL-259 connector of that end of the coax to the J-pole, and stretch-wrap about eight inches of *Stretch and Seal* completely around the connector, to prevent moisture intrusion (shown next page.)

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Use zip ties to secure the coax to the mast, in three or four places. Route the coax under the crown of the eaves to the wall, then straight down to the ground, securing the coax with cable ties and sheet metal screws. Bolt the 4 AWG wire through the middle hole of the mast grounding clamp, and route it along the same path as that of the coax, to the ground.

Grounding the antenna

Drive the 8-foot grounding rod into the dirt as directly under your antenna mast as possible, and within ten inches of your house wall, leaving about six to eight inches showing. Attach a grounding clamp to the ground rod, about three or four inches from the top. Bolt the 4 AWG wire through the middle hole of the grounding clamp. Attach another 4 AWG wire from the same grounding clamp to the service box by routing the wire straight down from the clamp into the dirt, about three to six inches underground along the wall of your house, emerging directly under the service box.

Attach another grounding clamp to the grounding rod, then bolt the corner brace to the middle screw of the clamp. Attach the bare bolt of the lightning arrester to any available hole of the corner brace. Estimate and cut off the coax hanging from the antenna, leaving enough slack such that its connector will be installed at a location to plug it comfortably into the lightning arrester. Unscrew the ring from the crimp PL-259 connector, and cut one to two inches of heat shrink tubing. Slip the heat shrink tubing, the connector crimp sleeve, and the ring onto the cut coax.

Strip the coax (remove the coax jacket for the length of the connector, thread back the shield, and completely remove half of the dielectric.) Slip the connector onto the stripped coax, so that the tip of the center conductor is about even with the tip of the connector, then quick-solder the tip of the coax to the tip of the connector. Cut the shield back to about 1/4" maximum. Slip the crimp sleeve over the shield and connector, so that it's flush with the connector, then crimp the sleeve. Slip the heat shrink tubing over the crimp sleeve and heat-shrink it to fit. Screw the ring back onto the connector.



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Use your ohmmeter to test the cable for continuity. Attach the newly installed coax connector to the lightning arrester. Apply *Stretch and Seal* (or any reliable self-fusing silicone tape) around the connector, completely sealing the entire connector from air and moisture intrusion. Install a PL-259 connector to the cut end of the coax. Plug the coax connector into the other side of the lightning arrester, and weather-seal it like the first one.

Route the coax along your house, just under your siding if you have siding, all the way to the entry point (location where the coax will enter your house,) securing the coax with cable clips and sheet metal screws about every sixteen to twenty-four inches. Avoid violating stucco if at all possible, unless you have some expertise with it, because drilling into stucco will often crumble the texture.



How you [route your coax into your house](#) is not covered in these instructions, because there are so many ways of doing that. The most direct way is to drill a 1/4" hole in the side of your house in a non-ugly location, just like the cable TV folks do, entering your house through a grommet or bushing as shown above. Another is (for newer homes) to feed the coax through the roof vent screen located at one of several places on your roof. Still another is to slide one of your windows down onto a *pass-through* that you can purchase, like this one to the left, a Comet CTC-50M.

Conclusion

Thanks to Carl, getting hold of one of the greatest VHF / UHF antennas in history is easy and inexpensive, but installing it high outdoors might not be quite so simple or cheap. As you can see, you don't have to be an electrician to mount one; you might be able to do it all by yourself, even with little or no experience. Once done properly, however, it'll bring you years of enjoyable hamming on the two most popular bands, with your audio coming through loudly and static-free on repeaters, and heard much farther away on simplex than otherwise. And when you double with somebody, you'll likely be the clear winner.

